

Assessing Chemical Hazards: A Prioritization and Risk Management Tool

Ms. Veronique Hauschild, MPH

presentation to MEDIC WMD 2000 - April 3,
2000

***Environmental Health Risk Assessment
and Risk Communications Program***

***U.S. Army Center for Health Promotion
and Preventive Medicine (USACHPPM)***

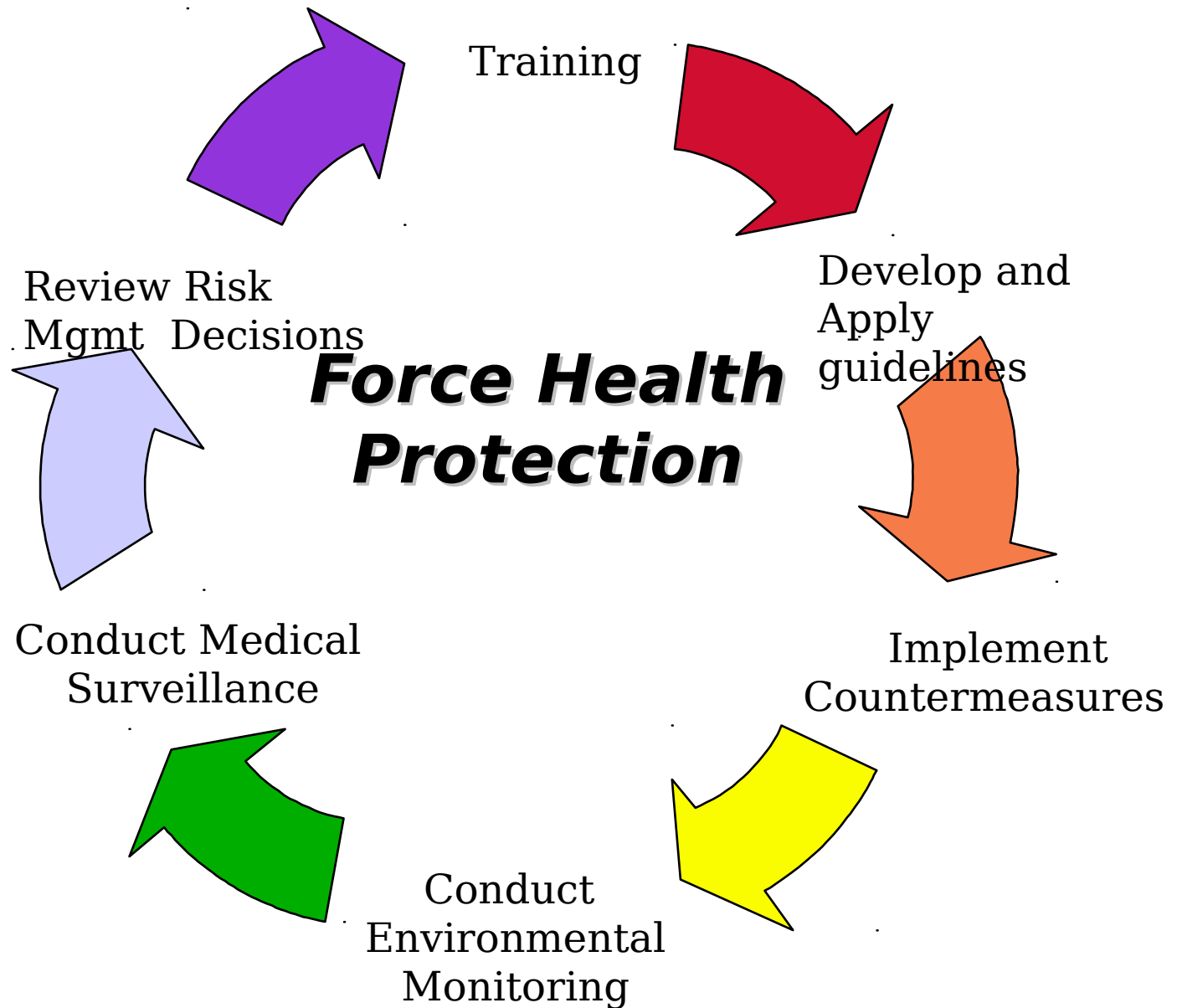
DSN 584-5213, comm 410-436-5213

Veronique.Hauschild@apg.amedd.army.mil

USACHPPM Medical Nuclear, Biological, and Chemical (NBC) GOALS

- **Establish field effective risk assessment tools that address Medical NBC threats on the modern battlefield**
- **Provide technical training on Medical NBC risk assessment**

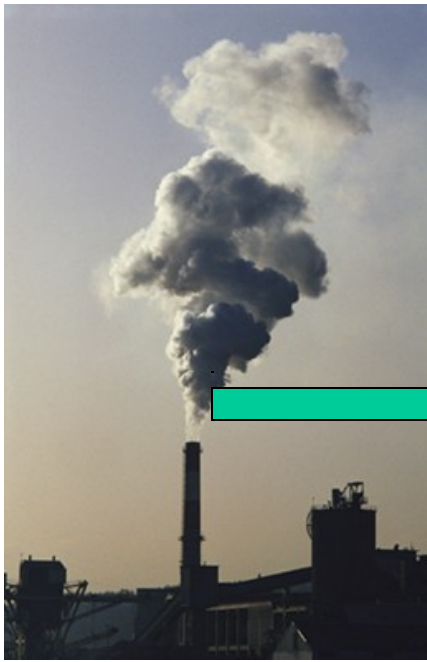
Funding support from OTSG, US Army (LTC C. Curling)



Purpose of USACHPPM Chemical Guidelines Initiative

Risk assessment/risk management tool to :

- Identify severity of chemical hazards and associated health impacts during deployments
- Determine analytical equipment needs
- Establish criteria for modeling
- Assess field sample data/modeled data for air, water, and soil



Environmental Hazards During Deployment

Operational Risk Management (ORM)

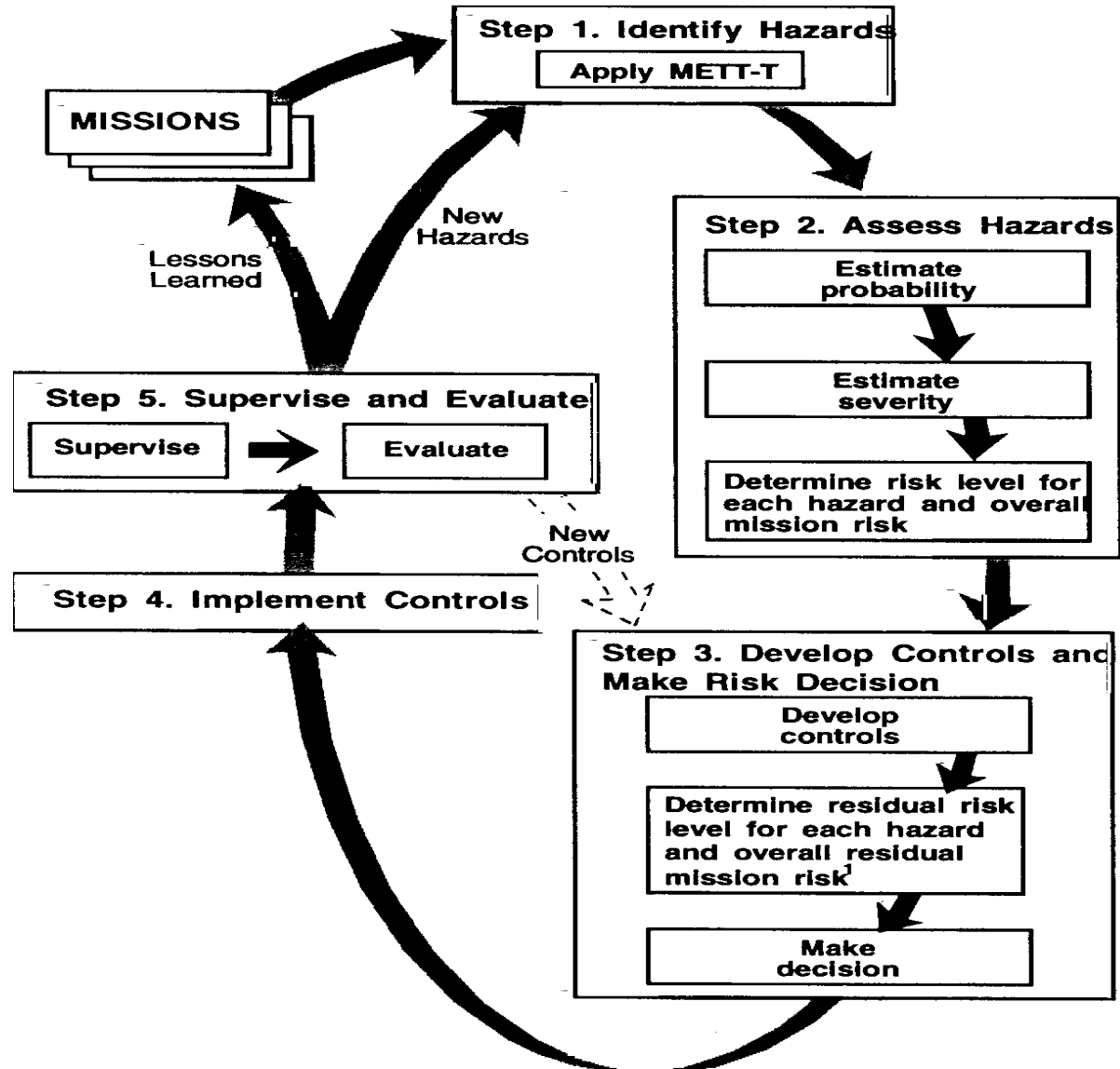
“Risk management is an effective process for preserving resources. It is not an event. It is both an art and a science...”

1. ~~FM 100-14, 1998~~ **Identify the hazards**
2. **Characterize risks**
 - **Determine SEVERITY**
 - **Determine PROBABILITY**
3. **Develop controls & make risk decisions**
4. **Implement controls**
5. **Supervise, evaluate, {and communicate}** (FM 100-14 Risk Management)



Continuous Application of Risk Management

(FM 100-14, *Risk Management*)



ARMY HAZARD RISK ASSESSMENT MATRIX

S E V E R I T Y		HAZARD PROBABILITY				
		Frequent	Likely	Occasional	Seldom	Unlikely
	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Department of the Army Field Manual 100-14, Risk Management

RISK LEVELS

E (Extremely High Risk) - Loss of ability to accomplish the mission.

H (High Risk) - Significantly degrades mission capabilities in terms of required mission.

M (Moderate Risk) - Degrades mission capabilities in terms of required mission.

L (Low Risk) - Little or no impact on accomplishment of the mission.

Simplified Risk Matrix

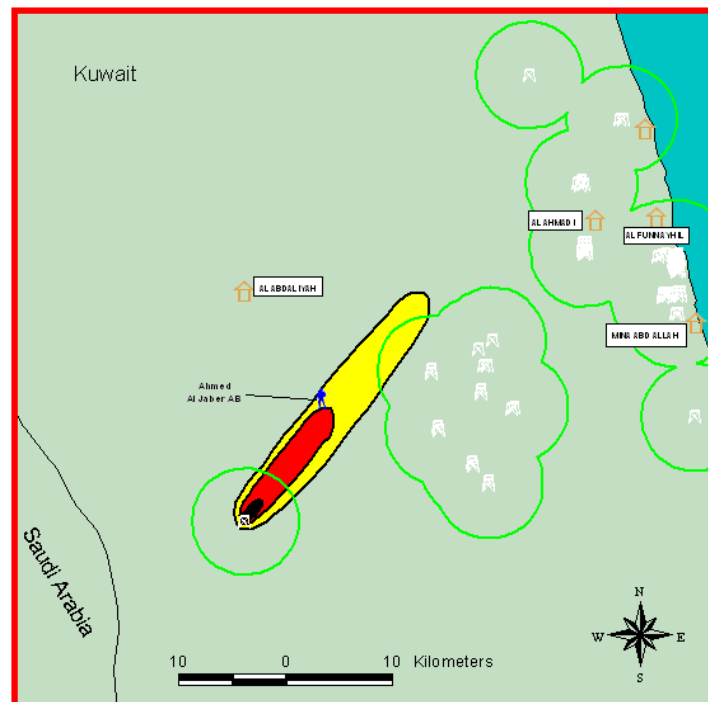
	<i>EXPOSURE</i>		
		<i>high</i>	<i>low</i>
<i>TOXICITY</i>	<i>high</i>	High priority	Medium priority
	<i>low</i>	Medium priority	Low priority



To assess/manage
short-term but
potentially severe
chemical hazards...

TG230A :

Military Air Guidelines-Short term
(MAGs-S)
Military Water Guidelines-Short term
(MWGs-S)





“TG 230 A”

- Concentration guidelines for duration of 1 hour up to 14 days
- Air, Drinking Water, (not soil)
- For military population
- Based on current methods/guidelines

USACHPPM TG 230A May 1999 Version
**Short Term Chemical Exposure Guidelines
for Deployed Military Personnel**



USACHPPM U.S. Army Center for Health Promotion and Preventive Medicine

LOCAL REPRODUCTION IS AUTHORIZED AND ENCOURAGED

➤ <http://chppm-www.apgea.army.mil/hrarcp/pages/CAW/in>

TG 230A Guidelines Extracted From Existing Criteria:

- AIR
 - Emergency Response Planning Guidelines (ERPGs)
 - Acute Emergency Guideline Levels (AEGLs)
 - Minimum Risk Levels (ATSDR- acute MRLs)

- DRINKING WATER
 - TB Med 577 (military standards)
 - EPA Health Advisories (1 and 10 day) Adjusted
 - ATSDR acute MRLs Adjusted

Acute Emergency Guideline Levels (AEGLs)

- Developed by Federal National Advisory Committee (lead by EPA)
- Includes 3 levels of severity for:
 - (10 minutes)
 - 30 minutes
 - 1 hour
 - 4 hour
 - 8 hour
- Similar values to ERPGs but for multiple durations and endorsed through regulatory channels
- Provides way to prioritize planning/prevent



AEGLs

AEGL Level 1: level at or above which general population (including sensitive individuals) may have some discomfort

AEGL Level 2: level at or above which general population (including sensitive individuals) may experience serious long-lasting effects or impaired ability to escape

AEGL Level 3: level at or above which general population (including sensitive individuals) could experience death



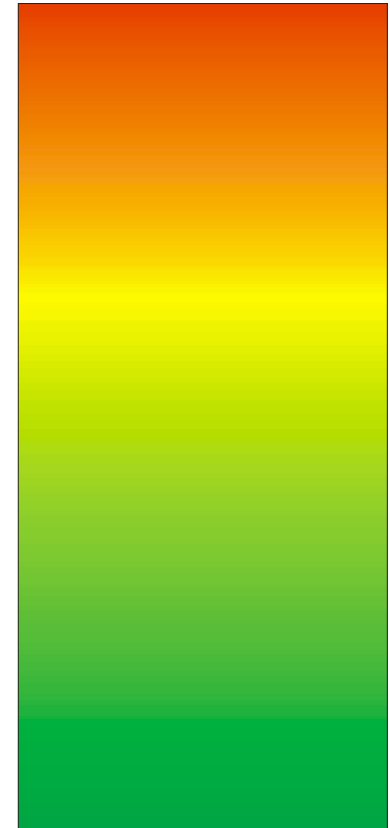
TG 230B - Long-term Exposures to Chemicals

- For >14 day to 1 year exposures (military deployments)
- Concentration guidelines for air, water, soil
- Primarily based on “NOAEL” (RfD-subchronic) and cancer SF with EPA Superfund methodology
- Additional guidance/standards used:
 - Air: NAAQS; ACGIH TWAadj; ATSDR MRLsAdj
 - Water: TB MED 577; EPA Health AdvisoriesAdj; MRLsAdj
 - Soil: Other standards- Lead; PCBs
- Establishes a concentration of NEGLIGIBLE severity for an assumed long-term exposure

Guidelines Include:

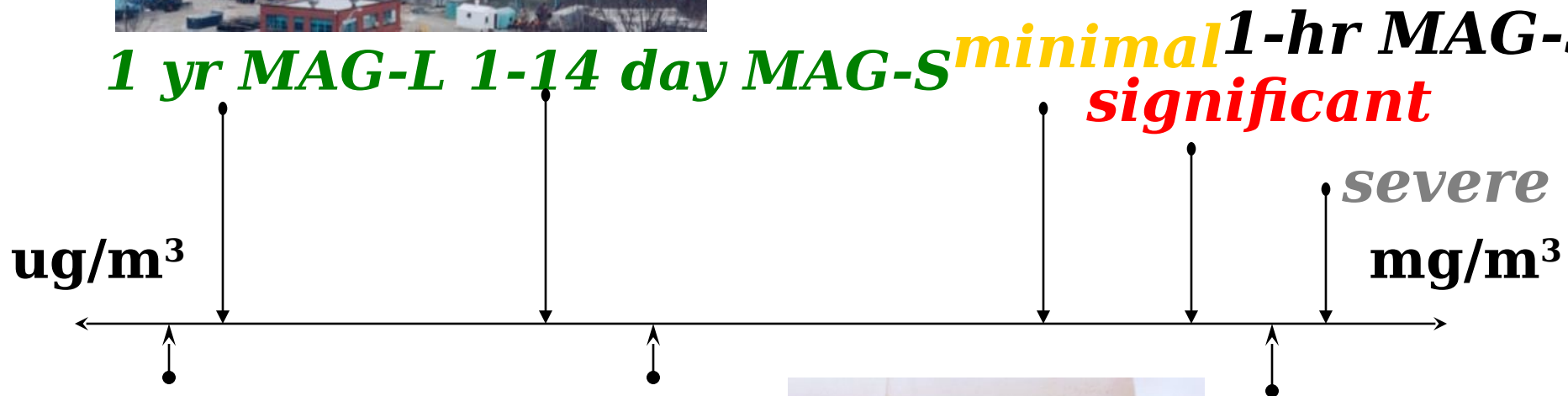
- Severe Effects
- Significant Effects
- Minimal Effects
- Negligible Effects

**Pronounced
Effects**



**Negligible or no
Effects**

Airborne Health Criteria 'Continuum'



EPA

TLVs



IDLH

Key Chemical Risk Assessment Concepts

- The dose makes the poison:
 - exposure mechanisms/pathways
 - exposure duration
- People are variables:
 - Exposure
 - Susceptibilities
- Absence of “acute” or short-term health effect may not mean “no effect”

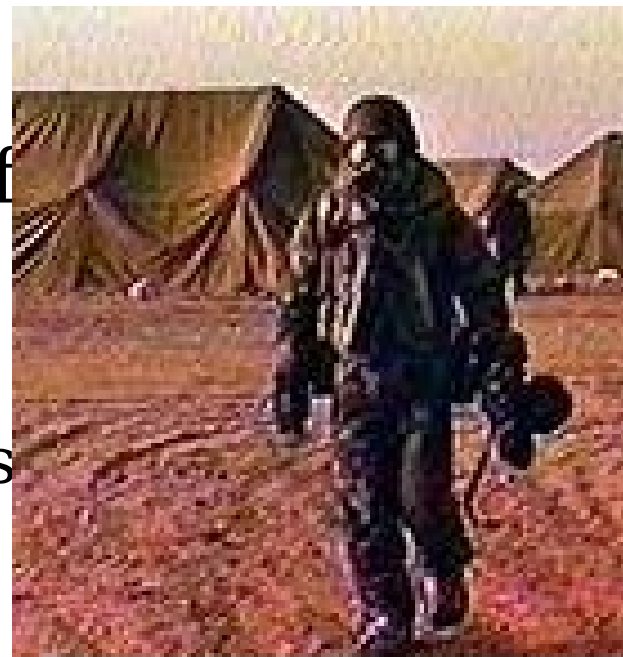
Key Chemical Risk Assessment Concepts, cont'd

Guidelines are designed to be
“protective” for planning and
prevention purposes but are
based on limited data:

should not be considered a finite,
prospective indicator of
population health effects

Key Chemical Risk Management Concepts

- There are different levels of
 - “safe” as survivable
 - “safe” as no effects
 - “safe” as an acceptable excess cancer risk



- CHEMICAL hazard/risk(s) should be considered on a relative scale to other hazards/risks

EXPOSURE INFORMATION AND MEDICAL SURVEILLANCE

- Availability of established and accepted guidelines ensures a consistent basis from which to prevent and/or minimize adverse health impacts - this can be documented with medical surveillance
- Medical surveillance and follow up of individuals exposed and/or not exposed will be useful in future evaluations of

